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(54) Title: APPARATUS FOR GENERATING ELECTRICAL PULSES AND METHODS OF USING THE SAME

(57) Abstract: A method and apparatus are provided for delivering an agent into a cell through the application of nanosecond pulse electric fields ("nsPEF's"). The method includes circuitry for delivery of an agent into a cell via known methods followed by the application of nanosecond pulse electric fields to said cell in order to facilitate entry of the agent into the nucleus of the cell. In a preferred embodiment, the present invention is directed to a method of enhancing gene expression in a cell comprising the application of nanosecond pulse electric fields to said cell. An apparatus for generating long and short pulses according to the present invention is also provided. The apparatus includes a pulse generator capable of producing a first pulse having a long duration and low voltage amplitude and a second pulse having a short duration and high voltage amplitude.